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## NOTICE OF ALLOWANCE AND FEE(S) DUE

45372 7590 02/22/2010  
MARSHALL, GERSTEIN & BORUN LLP (FISHER)  
233 SOUTH WACKER DRIVE  
6300 SEARS TOWER  
CHICAGO, IL 60606

EXAMINER

LE, JOHN H

ART UNIT

PAPER NUMBER

2863

DATE MAILED: 02/22/2010

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/589,728	08/17/2006	Kadir Kavaklioglu	302034/1615	9524

TITLE OF INVENTION: STATISTICAL PROCESSING METHODS USED IN ABNORMAL SITUATION DETECTION

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	05/24/2010

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. **PROSECUTION ON THE MERITS IS CLOSED.** THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN **THREE MONTHS** FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. **THIS STATUTORY PERIOD CANNOT BE EXTENDED.** SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

## HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

**IMPORTANT REMINDER:** Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

# **PART B - FEE(S) TRANSMITTAL**

**Complete and send this form, together with applicable fee(s), to:** Mail **Mail Stop ISSUE FEE**  
**Commissioner for Patents**  
**P.O. Box 1450**  
**Alexandria, Virginia 22313-1450**  
**or Fax** **(571)-273-2885**

**INSTRUCTIONS:** This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

45372 7590 02/22/2010

**MARSHALL, GERSTEIN & BORUN LLP (FISHER)**  
**233 SOUTH WACKER DRIVE**  
**6300 SEARS TOWER**  
**CHICAGO, IL 60606**

## **Certificate of Mailing or Transmission**

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/589,728	08/17/2006	Kadir Kavaklioglu	30203/41615	9524

**TITLE OF INVENTION: STATISTICAL PROCESSING METHODS USED IN ABNORMAL SITUATION DETECTION**

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	05/24/2010

EXAMINER	ART UNIT	CLASS-SUBCLASS
LE, JOHN H	2863	702-179000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.  
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a **Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 \_\_\_\_\_  
(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 \_\_\_\_\_  
3 \_\_\_\_\_

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee  
☐ Publication Fee (No small entity discount permitted)  
☐ Advance Order - # of Copies \_\_\_\_\_

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.  
☐ Payment by credit card. Form PTO-2038 is attached.  
☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number \_\_\_\_\_ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature \_\_\_\_\_ Date \_\_\_\_\_  
Typed or printed name \_\_\_\_\_ Registration No. \_\_\_\_\_

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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## Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 0 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 0 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

**Notice of Allowability****Application No.**

10/589,728

**Examiner**

JOHN H. LE

**Applicant(s)**

KAVAKLIOGLU, KADIR

**Art Unit**

2863

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 01/22/2010.
2. ☒ The allowed claim(s) is/are 1,5-41,51-53 and 70-80.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some\* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date \_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date \_\_\_\_
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_.

/John H Le/  
Primary Examiner, Art Unit 2863

**EXAMINER'S AMENDMENT**

***Election/Restrictions***

1. Applicant's election **without traverse** of Group I (Claims 1-56) in Paper mailed on 01/07/2009 is acknowledged. Accordingly, claims 57-69 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

***Response to Amendment***

2. Applicant's amendment filed 01/22/2010 has been entered and carefully considered.

Claims 1, 39, 51, 70-74 have been amended.

Claims 2-4, 42-50, 54-56 have been cancelled.

Claims 57-69 have been withdrawn.

Claims 77-80 have been added.

***Examiner's Amendment***

3. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

The application has been amended as follows:

Claims 57-69 have been cancelled.

***Reasons for Allowance***

4. Claims 1, 5-41, 51-53, and 70-80 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

The prior art fails to teach the invention as claimed in independent claim 1, requiring in a method of detecting an abnormal situation associated with a process plant, wherein collecting a number of first data points for the process parameter, using a processor for determining a frequency component of the process parameter based on the collected number of first data points, determining a dominant system time constant from the frequency component and setting the block length based on the dominant system time constant. It is these limitations as they are claimed in the combination with other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

The prior art fails to teach the invention as claimed in independent claim 39, requiring in a method of detecting an abnormal situation associated with a process plant, wherein using processor for determining a mean value of the differential pressure across the catalyst valve in the fluid catalytic cracker from the received differential pressure measurements; comparing the mean value of the differential pressure across the catalyst valve to the baseline value; and detecting the existence of an air blower problem based on the comparison of the mean value of the differential pressure across the catalyst valve to the baseline value when the mean value of the differential pressure across the catalyst valve is less than the baseline value. It is these limitations as they are claimed in the combination with other limitations of claim, which have not been

found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

The prior art fails to teach the invention as claimed in independent claim 51, requiring in a method of detecting tray dumping or tray damage in a distillation column, wherein using a processor for determining a mean value of the differential pressure from the differential pressure measurements; comparing the mean value of the differential pressure to a low differential pressure baseline value; and detecting the existence of tray dumping or tray damage based on the comparison of the mean value of the differential pressure to the low differential pressure baseline value when the mean value of the differential pressure is lower than the low differential pressure baseline value. It is these limitations as they are claimed in the combination with other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

The prior art fails to teach the invention as claimed in independent claim 70, requiring in a method of detecting an abnormal situation in a fluid catalytic cracker, wherein using a processor for determining a mean value of the level parameter from the received level parameter measurements; comparing the statistical measure of the level parameter to a baseline value; and detecting the existence of an abnormal pipe plugging situation based on the comparison of the statistical measure of the level parameter to the baseline value when the mean value of the level parameter becomes greater than the baseline value. It is these limitations as they are claimed in the

combination with other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

The prior art fails to teach the invention as claimed in independent claim 71, requiring in a method of detecting an abnormal situation in a fluid catalytic cracker, wherein using a processor for determining a cross correlation between the first and second level parameters and the first and second pressure parameters from the process parameter measurements; using a processor for comparing the cross correlation between the first and second level parameters and the first and second pressure parameters to a baseline value; and detecting an abnormal situation in the form of pipe plugging between the reactor and the regenerator when the cross correlation changes by a value greater than a baseline value. It is these limitations as they are claimed in the combination with other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

The prior art fails to teach the invention as claimed in independent claim 72, requiring in a method of detecting an abnormal situation in a fluid catalytic cracker, wherein using a processor for determining a mean value of the temperature parameter from the temperature parameter measurements; using a processor for comparing the mean value of the temperature parameter to a baseline value; and using a processor for detecting the situation insufficient steam flow based on the comparison of the mean value of the temperature parameter to the baseline value when the mean value of the temperature in the fluid catalytic cracker becomes greater than the baseline value. It is



these limitations as they are claimed in the combination with other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

The prior art fails to teach the invention as claimed in independent claim 73, requiring in a method of detecting an abnormal situation in a fluid catalytic cracker, wherein using a processor for determining a cross correlation between the first and second level parameters and the first and second pressure parameters from the process parameter measurements; using a processor for comparing the cross correlation between the first and second level parameters and the first and second pressure parameters to a baseline value; and detecting an abnormal situation in the form of pipe plugging between the reactor and the regenerator when the cross correlation changes by a value greater than a baseline value. It is these limitations as they are claimed in the combination with other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

The prior art fails to teach the invention as claimed in independent claim 74, requiring in a method of detecting tray plugging in a distillation column, wherein using a processor for determining a mean value of the differential pressure parameter from the differential parameter measurements; comparing the mean value of the differential pressure parameter to a high differential pressure baseline value; and detecting the existence of tray plugging based on the comparison of the mean value of the differential pressure parameter to the high differential pressure baseline value when the mean

value of the differential pressure is higher than the high differential pressure baseline value. It is these limitations as they are claimed in the combination with other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

The prior art fails to teach the invention as claimed in independent claim 77, requiring in a method of detecting an abnormal situation in a fluid catalytic cracker, wherein using a processor for determining a standard deviation of the differential pressure across the catalyst valve in the catalytic cracker from the received differential pressure measurements; comparing the standard deviation of the differential pressure across the catalyst valve to a baseline value; and detecting the existence of catalyst flow problem based on the comparison of the standard deviation of the differential pressure across the catalyst valve to the baseline value when the standard deviation of the differential pressure across the catalyst valve is greater than the baseline value. It is these limitations as they are claimed in the combination with other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

The prior art fails to teach the invention as claimed in independent claim 80, requiring in a method of detecting an abnormal situation in a fluid catalytic cracker, wherein using a processor for determining a mean value of the temperature parameter from the temperature parameter measurements; comparing the mean value of the temperature parameter to a baseline value; and detecting thermal extremes based on the comparison of the mean value of the temperature parameter to the baseline value

when the mean value of the temperature in the fluid catalytic cracker becomes greater than a first baseline value or less than a second baseline value. It is these limitations as they are claimed in the combination with other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

Daw et al. (USP 6,901,351) disclose method of detecting an abnormal situation in a fluid catalytic cracker (e.g. Col.9, lines 37-52), comprising: receiving measurements of a differential pressure between two locations (sensor 4 may be pressure transducers 60) in the fluid catalytic cracker (e.g. Fig.6, Col.18, lines 9-14) ; the computer 6 analyzes the sensor data, the analysis involving standard statistics (e.g. range, variance, standard deviation, skewness, rms, kurtosis...etc.) and determining a statistical measure of the differential pressure between two locations (sensor 4 may be pressure transducers 60) in the fluid catalytic cracker (e.g. Fig.6, Col.18, lines 9-14) from the process parameter measurements (see Col. 9, lines 46-67);comparing the statistical measure of the process parameter to a baseline value (e.g. Fig.3, Col.10, lines 22-45).

Ford et al. (USP 7,181,654) disclose method of detecting an abnormal situation in a fluid catalytic cracker (e.g. Col.9, lines 37-52), comprising: receiving measurements of a differential pressure between two locations (e.g. Col.6, lines 49-55) in the fluid catalytic cracker (agitator 30) (e.g. Col.9, lines 37-52, Col.10, line10-12); determining a statistical measure of the differential pressure between two locations in the fluid catalytic cracker from the process parameter measurements (e.g. Col.10, lines 10-41);comparing

the statistical measure of the process parameter to a baseline value (e.g. Col.12, lines 35-52).

Heavner et al. (US 20005/0267709 A1) disclose a method of detecting an abnormal situation associated with a process plant (heater in process plant), comprising: receiving measured data pertaining to a process parameter sensed by at least one sensor device (pressure sensors, temperature sensors) associated with the process plant; determining one or more statistical measures associated with the process parameter using the measured data; and using the one or more statistical measures associated with the process parameter to detect an abnormal situation within the process plant (e.g. paragraph [0017]).

However, Daw et al., Ford et al., and Heavner et al. do not disclose the limitations in the independent claims 1, 39, 51, 70-74, 77, and 88 as discussed above .

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

#### ***Contact Information***

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOHN H. LE whose telephone number is (571) 272-2275. The examiner can normally be reached on 9:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew A. Dunn can be reached on (571) 272-2312. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/John H Le/  
Primary Examiner, Art Unit 2863  
February 22, 2010